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"M E N T A L A S S O C I A T I O N".

A Thesis

Presented to the Faculty of the

Dep't.of Philosophy

UNIVERSITY of PENNSYLVANIA, by

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Candidate for the degree of Ph.D.

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Section I. Introductory.

The object of the present essay is to give a general account of the phenomena usually embraced under the term Association. As used by some psychologists, this process is assumed as a basal principle of all mental operations from the highest to the lowest. The scientific value of this view, with certain modifications, I propose considering in the sequel.

I think it would be best in view of the plan of my paper, to examine first instances of association where it is admitted by all psychologists to be operative. These are well exemplified in that group of phenomena frequently called Association of Ideas. The subject has been gone over again and again, so often indeed that it seems almost presumptuous to add another attempt to the long list. Recent writers, however, are not all agreed on an explanation and it will be desirable for me to give an account of the phenomena, criticizing where necessary current views opposed to mine.

In all departments of psychology, great confusion has been occasioned by a careless use of terms, and this is especially true of this particular subject. Some words have been so variously applied that they are now hardly fit for

scientific usage. One important confusion which I have in mind and which must be carefully guarded against is that between descriptive terms used as though explanatory and real terms of explanation. It was a confusion of this kind which gave rise to the old faculty hypothesis. It was thought that the class concepts which described quite well related groups of psychic phenomena could also be considered as an explanation of how these phenomena were produced. In this way the titles of descriptive categories came to be looked upon as forces and causes of the individual mental states. Thus Judgment was the ultimate explanation of all particular cases of judgment; Imagination, a sufficient cause and explanation of all particular imaginative processes. The effects of this way of regarding the matter can still be discovered in the writings of many psychologists. Especially in the case of "will", the old descriptive, pseudo-~~casual~~ causal categories are much in evidence. This turning of abstractions and class concepts into real things seems to be a natural mental tendency. Although showing itself most conspicuously in metaphysicians like Plato and Spinoza, it is seen to crop up more or less distinctly in contemporary philosophers and psychologists. Stout considers this tendency to invest abstractions with an illusive reality peculiarly strong in introspective psychology "because the plurality of particular instances which exemplify the class concepts are as regards their specializing details, so fugitive and

indistinct". (Analytic Psychology Vol.I. P.18). According to Stout, the credit for having attacked innate faculties belongs to Leibnitz, who condenses his polemic in the pregnant maxim, "A naked possibility is nothing." "Real explanation", says Stout, "assigns definite conditions, through which by the operation of definite laws, definite results must arise." I entirely agree with Stout in regarding such words as potentiality, faculty, susceptibility where we are unable to resolve a fact into its factors as mere masks for our ignorance. "It never seems to have occurred to them (the followers of the Faculty Psychology) that the powers of understanding, willing, imagining, etc. instead of existing at the outset might have arisen as the result of a long series of changes, each of which paved the way for the next." Now, exactly the same criticism is applicable to those who regard the principal types of association as coordinate laws, having the power to bring about associations of a particular kind. I shall examine later the claims of the various principles to be regarded as ultimate explanations or "laws". It is this confusion which has caused the expressions "Association by Similarity", "Association by Contrast", etc. to be regarded by some as fundamental, irreducible laws of association. Instead of being restricted to a merely descriptive use - and it is hoped that what follows will show this to be the only legitimate employment of the terms, they have

been appealed to as ultimate explanations. In this connection the following sentences from Wundt's "Human and Animal Psychology" express very clearly the point I am here considering: "It is scarcely necessary to say that these are really simply forms and not 'laws' of association; they are not universally valid conditions of its origin. They merely serve to furnish classificatory concepts, under which the ready-made products of association can be subsumed. But curiously enough the authority of Aristotle and the constant inclination of the human mind towards logical schematism have worked no less harm in this department of psychology than they worked in the sciences of nature. Aristotle had distinguished four kinds of memory, in terms of the logical opposites "Similarity" and "Contrast", "Simultaneity" and "Succession", just as he had arranged the fundamental qualities of all natural bodies under the rubrics of the contraries, 'hot and 'cold, 'moist' and 'dry'; and these four forms have held the field, despite the evidence of observation, down to our own day".

Section II. Definition of Association.

The most superficial observation of the stream of consciousness shows it to consist of ideas or idea trains, conditioned either by our immediate perceptional environment or previous mental content. The thoughts which follow each other do not appear in a hap-hazard, unrelated fashion, but seem to have discernible connections. Expressed in other words, we may say, one idea seems to be the determinant, to a great extent, of the next. In so far as this is the case, I would say that the ideas were associated. The ideas thus connected may be ideas corresponding to previous simultaneous experiences, in which case, the association is frequently described as one of contiguity, by some psychologists as external association and by others as continuous association (these terms being various designations for the same fact), or they may be ideas which resemble each other and have never been experienced together (association by similarity); or they may be ideas having certain relations to each other, such as cause and effect, object and its properties, etc.etc. These and other categories of associated ideas have long been in use. Descriptions of them are legion. The orderly sequence of ideas would be apt to lead one to make such classifications.

The above classes or kinds of ideal connection are what James would call connections thought of between ideas, and

he is undoubtedly correct in holding that it is impossible to deduce any principles or laws of connection from these. We are therefore left to a consideration of connections between thoughts if we wish to have any hope of finding principles. (Psychology Vol.I, P.551). With the single exception that I do not subscrive to James's doctrine of the distinction between the ideas or thoughts of things and the things thought of, the following sentences from his Psychology (Vol.I.P.554) may be quoted as a concise statement of the nature of association: "Association so far as the word stands for an effect is between things thought of - it is things not ideas which are associated in the mind -. . . . .and so far as association stands for a cause it is between processes in the brain - it is these which by being associated in certain ways, determine what successive objects shall be thought."

I should consider then that any two mental states were associated when one of them (probably, but not necessarily by its cerebal connections) can act as a determinant of the other. There need not be an actual recall, but simply a connection which might under some circumstances lead to a recall. The most usual evidence for such a connection is of course the actual reinstatement of the previously conjoined or similar idea, but even when this does not take place, we may have what Stout would call a psycho-physiological disposition, which may ~~imagine~~ manifest itself in other ways.

Section III. The nature of Sensation and Idea.

In explaining how association of ideas is brought about, we must consider two things, (1) What are ideas? (2) How are they associated? I shall indicate the answer to the second question first. The only principle I shall assume to explain the process is what has been called "Association by Contiguity". This law simply stated is as follows: When two or more conscious states coexist or immediately succeed one another, they are by this fact so connected that a recurrence of one will have a tendency to call up - or perhaps I had better say - to be followed by the other. This one principle taken in connection with the view of the ideational process shortly to be developed is sufficient to my mind to explain all cases of association, whether of similarity, cause and effect, contrast, or what not. The theory, besides accounting adequately for all the facts, is also especially commended by the way in which it lends itself to physiological explanation. Moreover, introspection testifies strongly in its favor.

Now, as to the first question, the nature of ideas. First, there is no such thing as an absolutely simple idea, no more than there can be an absolutely simple perception. Perception is, so to speak, the raw material out of which ideas are made, or, it might be better to say, whose remains are ideas. "Nihil est in intellectu quod non fuerit (in sensu)". In spite of the various restrictions and adverse

arguments to which it has been subjected, this famous dictum of empiricism stands substantially unchanged. This can, it seems to me, be taken for granted without further discussion. Of course I do not mean that the ideas are exact reproductions of the perceptions. But they are to my mind the same sort of entities and depend on one another. This being so, we are justified in examing our sensations and perceptions to ascertain broadly the nature of their ideational correlates or remains; somewhat as the paleontologist, by a reverse process, from the fossil remains of an animal discovers its shape and habits. The psychologist, however, in his inquiry has the advantage of the paleontologist in that he has both the object and its vestiges and can turn his attention to either at will.

Before proceeding to an examination of the ideational process, and in order to avoid any possible misconception, I wish to present clearly exactly what I mean by "idea". As I use the term it may or may not imply an objective reference. Any psychosis, not caused by peripheral excitations occasioned from without or within the body I consider an idea. This negative description of the term does not to my mind embrace too much. Emotions, qua emotions, are e.g. not included as ideas; for accepting, as I do, without reservation James's theory, emotions are sensory experiences, initiated within the body and transmitted to the brain along

sensory nerves. Again, I would not hold with Stout, that perceptions necessarily preceded ideas. He distinguishes ideas from impressional revivals, whereas I would include them both under the term ideas. If we can conceive an anoetic experience revived or reinstated by some cause, possibly physiological merely, I would call this revival an idea in contradistinction to the original sensation. This terminology seems to me entirely justifiable and I shall freely use it. According to this view, ideas are of all degrees of complexity, just as there are all grades of sensation and perception.

Section IV. Perceptional & Ideational Complexity.

Presentation must always precede and condition representation - there must be something to be revived before there can be any revival. Let us then first examine our presentational experiences and see what we may then be led to expect in our ideal systems. Now, in the first place, none of our sensations are simple, but all are more or less complex. Take, for example, the most perfect of our senses,, viz. sight. What a variety of color sensations are generally crowded in the visual field! A number of these which may be traced back to photo-chemical disturbances in the neighbourhood of the fovea, enter consciousness more clearly than the rest. The recollection of these is probably also the

clearest part of the mental image, but they need not appear to the exclusion of the dimmer portions of the sensational complex, the outlying regions of the visual field. The same observations may be made, though with less force, of the other senses. Our hearing, for example, is constantly assailed by a multitude of various sounds of which one - usually the most intense or interesting - forms, as it were, an auditory foveal excitant, while the others surround it in more or less indistinctness. As I write this, a trolley-car bell attracts most of my auditory attention, but there are at the same time a number of different sounds of which I am conscious in a greater or less degree; a bird next door is singing, some baseball players in an adjoining yard are loudly applauding a presumably brilliant play, a wagon is rumbling over the cobbles in a neighbouring street; a few doors above a yard is being vigorously swept and this pen is scratching miserably. Here also we see how complex our auditory sensations are, and how they in a general way, conform to the type of the visual.

In touch we have organs which correspond to the fovea of vision; viz., the finger tips, lips and tongue, which often act as the cause of a central clear portion of the tactual field. And it seems to me that the same is true, though probably to a less degree, of the other senses. Enough has been said, however, to show how wonderfully complex our every-

day sensations are, and on these grounds alone - although we have the more direct evidence of introspection - we might reasonably infer the nature of ideational experiences, corresponding, as they do, fairly accurately with the presentations. We have also seen that in our sensations, especially in the most important of all, sight, a limited portion of the sensory field is generally singled out and given especial prominence, this being the result either of some special physiological arrangement as in sight and touch, or of the greater intensity of the sensation itself. When we furthermore consider that during our waking hours, all these sensational activities are incessantly going on at the same time, we may form some notion of the complexity of the experienced sensory group of any moment and hence of its ideational representative. Of course, the complexity of the latter is still further increased by virtue of the mind's retentiveness, so that we are not restricted to the mere recall of a single sensory field, but the entire series of past experiences is, in a sense, at our disposal.

So much being shown, we may now pass to an introspective examination of the ideal contents themselves. We may begin our exposition with a quotation from Clifford. In his interesting lecture on "Body and Mind", he says: "It seems to me that there is only one kind of consciousness, and that is to have fifty thousand feelings at once and to know them all in different degrees. Whenever I try to analyze any part-

icular state of consciousness in which I am, I find that it is an extremely complex one. I cannot help at this moment having a consciousness of all the different parts of this hall and of a great sea of faces before me; and I cannot help having the consciousness at the same time, of all the suggestions that that picture makes, that each face represents a person sitting there and listening or not as the case may be, and I cannot help combining with them at the same moment a number of actions which they suggest to me and in particular the action of going on speaking. There are a great number of elements of complexity which I cannot describe because I am so faintly conscious of them that I cannot remember them. Any state of our consciousness then, as we are at present constituted is an extremely complex thing" etc. So much for ideational complexity.

Section V. The Process of Ideation.

To arrive at a clear idea of the ideational process itself and in its simplest form we had best consider what takes place when we give ourselves up to reverie or, as the saying goes, to the play of fancy. Here idea follows idea apparently without our interference. In this case, it is true that the ideas seem to spring for~~the~~th perfect, fully developed/ like Minerva from the head of Jove; but on closer analysis it is seen that this description does not conform to the facts. There is an interval which elapses between

these two so-called ideas. This interval is not an unconscious gap, but is filled with a psychosis often vague and indefinite. Its function is, however, of great importance and some knowledge of its nature can be gained by close introspection. This vague conscious interval is at once the decadence of the passing idea and the arising of the coming idea. For example, an idea is in consciousness. It is, as we have said, complex, consisting of many components. Now, certain of these - for reasons which will be treated of later as the momenta of association - "stick" in consciousness; the others fall out. This process we may designate the decadence or breaking up of the idea. The ideational portion which remains, however, now clusters about itself other elements, and when this process is complete we have what in ordinary parlance is called an idea. This in turn breaks up, certain elements falling out, certain elements remaining, and giving rise by a similar clustering process to another idea, and thus the process continues, the death of one idea being the birth of the next.

According to this view, an idea (in the popular sense) is regarded as consisting of a central portion or nucleus and a surrounding cluster, the psychical centre being what we may be allowed to term "fovea" of consciousness. If we must employ figurative terms, I think that <u>fovea</u> is superior to "focus", a term frequently used, but which gives no in-

dication of the psychological process as above explained. I may remark, in the preceding discussion I have used the term "idea" in a restricted sense, corresponding broadly to the popular meaning of the word.

Section VI. Description of Process of Association.

We may now ask: What determines this grouping? Which elements tend to cl ster and why? Our answer is, as before stated, simply the working of the law of contiguity. If the element a "sticks" in consciousness, there will tend to cluster about it those ideational elements which were simultaneously (or nearly so) experienced with it, either in sensation or thought. Expressed in its simplest physiological form, the law is as follows: When two psychoses a and b are experienced together, an association path is formed between their cerebral bases along which path conduction is easier, the more frequently they have appeared or been thought of in conjunction; or as James expresses it (Psychology Vol.I.P.566) "When two elementary processes have been active together or in immediate succession, one of them, on recurring, tends to propagate its excitement into the other." This is the neural law of habit which lies at the basis of all physiological description of psychic facts.

From a mere consideration of our multifarious sensational experiences, it will be seen how wonderfully numerous

and intricate must be the paths of ideational association, and the anatomy and histology of the central nervous system also testify to the truth of this fact. We may now look upon the cerebrum with all its ganglia and fibers as the basis of an immense system of ideational elements, all more or less connected or capable of becoming connected. These elements rarely or never exist isolatedly, but in organized groups or systems, some of which are introspectively analzable, while others elude all our powers of analysis, but which we are forced to look upon as complexes, e.g.,the percept systems which will be described later.

In this connection we can do no better than to cite Ribot. In his essay on "Diseases of Memory" (Chap.I.) he says: "We may regard the nervous system as being traversed by continual discharges. Of these nervous actions, some answer to the incessant rhythm of the vital activities; other, much fewer in number, to the succession of states of consciousness, still others, and these are by far the most numerous, constitute unconscious cerebration. The six hundred (or the twelve hundred) million cells and the four thousand or the five thousand million fibers, even allowing for those which are inactive or remain during the whole period of life without occupation, offer a considerable contingent of active elements. Unconscious cerebration not being subject to the conditions of time, and taking place,

so to speak, only in space may act in different places simultaneously. Consciousness is the narrow wicket through which a very small portion of all this work becomes visible to us."

It may sometimes happen that the connecting link of two ideas does not attain to full consciousness, or that it may fall altogether below the threshold of consciousness. If this be true, although some of Münsterbergs results seem to throw some doubt upon it, we are forced to suppose an active cerebral element persisting in a state of excitation, though of insufficient intensity to arouse consciousness. Münsterberg's found that in a number of cases when the letter A and some unfamiliar complex character - e.g. a Japanese letter - were presented together, and a short time later another letter B and the same complex character were presented (a series of such experiments being made) that A would afterwards call up B directly only about as many times as one would be led to expect from the mere play of chance or probability, thus seeming to indicate that the associative efficacy of the unremembered link was nil. These results, however, are not entirely satisfactory, and at any rate should not be taken to contradict so probable a fact, and one of experience too, that one idea may be followed by another without the appearance in consciousness of the element which was contiguous with each of them. It is but natural to suppose

that such associations would sometimes occur.

We may now proceed to show how this view of the ideational processes and association disposes of the so-called "laws" of association, such as similarity, contrast, etc. I do not say that these terms should be discarded. On the contrary, it may be well to retain them - just as we do the classes of the faculty psychology - remembering, however, that they are in reality descriptive and must not be looked upon as explanations. And, first of all, what is similarity? This question may be answered in two ways, depending on our point of view. Two objects are similar which are partially identical. Again from the subjective point of view, the feeling of similarity results from the perception of this relationship of partial identity. This feeling does not precede but must follow the revival of a similar idea. The feeling cannot, therefore, be the cause of the revival. When this is seen, the absurdity of invoking similarity as a special power becomes apparent. As James says (Psychology Vol.I.P.591),"The similarity between the objects or between the thoughts (if similarity there be between these latter) has no causal agency in carrying us from one to the other. It is but a result - the effect of the usual causal agent when this happens to work in a certain particular and assignable way. But ordinary writers talk as if the similarity of the objects were itself an agent, co-ordinate with habit and

independent of it, and like it able to push objects before the mind. This is quite unintelligible. The similarity of two things does not exist till both things are there - it is meaningless to talk of it as an agent of production of anything, whether in the physical or psychical realms. It is a relation which the mind perceives after the fact, just as it may perceive the relations of superiority, of distance, of causality, of container and content, of substance and accident, or of contrast, between an object and some second object which the associative machinery calls up."

The revival in the case of similarity must obviously be brought about by means of the common components, and this is readily explained according to the above view of the ideational process together with the law of contiguity. The distinctive feature of association by similarity is that a very small portion of the idea group "sticks" - generally a portion which was quite prominent in this idea - and, acquiring a salience in consciousness, clusters about itself other ideational elements, all of which, according to our theory, must have previously coexisted with it either in experience or thought, and the result is what is commonly called a similar idea. Thus, when a few days ago, the thought of my mother called up the idea of a certain school girl, although I had never seen or thought of them together before, I could, on reviewing the phenomena, clearly distinguish the

following mental states: first, the thought of my mother as I had lately seen her, then a less clear thought of her dress. Here the idea arose without the addition of any new elements. Her peculiarly shaped basque now gained the 'fovea' of consciousness although the remaining portions of the dress had not completely dropped out, becoming, however, dimmer and dimmer until this persistent basque element which now dominated consciousness had clustered about itself ideational elements which had been experienced with it before, viz.,a school girl who wore a basque of the same pattern and style. Ordinarily, I think I should have described the process as the mere succession of two perfect ideas, viz.,that of the mother and that of the girl. Since I have been watching for these associations, I have had quite a number which I have been able to analyze more or less satisfactorily in this way. It may frequently occur that the process is so rapid that it eludes our power of observation. I am confident that any one who will take the trouble can by introspection verify the above account.

My thesis, however, is not dependent on such introspection, although it is undoubtedly strengthened by it. The above consideration of similarity as partial identity would alone be apt to lead to some such explanation, as soon as it was understood that merely saying that two ideas were similar would not be a sufficient elucidation of how one would rein-

state the other. The identical portion which persists - in the above illustration, the basque - is not of course similar in the two ideas or idea-groups, - it is the same identical mental element throughout the entire process. True, it may grow or decrease in intensity, or undergo some modification in its changed setting, we are nevertheless justified in maintaining that it is the same element. In what sense do I use the word "same" here? I answer, just as it is used with regard to a musical tone with its crescendo and diminuendo, its variations in quality and character. We say that the note is the same in all its phases. The case of the persistent mental element is precisely analagous.

After giving an account of association by similarity substantially the same as the preceding, James mentions (Psychology Vol.I.P.582) some interesting instances, where the common element of the two ideas is very difficult or impossible to determine. One of the most striking of these instances is the description of a family as having "blotting paper voices"; "the image though immediately felt to be appropriate, baffles the utmost powers of analysis." In explanation of these cases, James says, "In these instances we must suppose that there is an identical portion in the similar objects, and that its brain tract is energetically operative without however being sufficiently isolable in its activity to stand out per se and form the condition of a

distinctly discriminated 'abstract idea'".

A very short account of association by contrast, which some persons still regard as a special law of association, is all that will be necessary in this place. The general description of similarity associations accounts also for the cases of contrast. It is evident that contrast is nothing but unlikeness in similarity. Cold and hot are temperature ideas; black and white, color ideas; palace and hovel, house ideas, etc. There is, in other words, a common core to every two contrasted ideas. This fact is so obvious that it needs no further mention. Contrast is a special case of similarity. The process may be best shown by an example. When the idea "hot" is succeeded by the idea "cold" the ideational element, previously associated by contiguity, and which now "sticks" in consciousness is "extreme temperature." This element now calls forth one of its contiguous ideas, viz.,"cold" and the revival is complete. I feel sure that an introspective examination would show this account to represent the facts accurately. Since I have been a student of psychology, I have not experienced an association which I could be certain was due entirely to the contrast of the ideas. Many of the so-called cases of association by contrast can be explained by pure contiguity, which has been favored by frequent repetition. Such are e.g.such couples as "lion" and "lamb", "youth" and "old age", etc. However,

even these ideas were probably originally associated in the manner above described, the more or less distinct idea of its being an extreme case acting as the connecting link.

It will be seen that this account differs somewhat from the explanation given by James (Psychology Vol.I.P.592). According to him an association by contrast is a mere accident of association by similarity. This may be true of some instances, but as a general explanation it is undoubtedly unsatisfactory. If contrast is to be viewed as a momentum at all - and many who have experienced such associations declare that it should be - then James's remark that " a machinery which reproduces a similar at all, may reproduce the opposite similar as well as any intermediate term" is seen to be an insufficient explanation. The description given above in the case of "hot" and "cold" enables us at least to understand the feeling of momentum frequently ascribed to the association. When it is said that contrast is operative in bringing about an associative revival, all that can be meant is that in the case of "hot" and "cold", for instance, the idea "hot" was followed by the idea "extreme temperature" and this in turn by the idea "cold", obviously association by contiguity throughout. It is, I think, this connecting link, in this case "extreme temperature", entering more or less clearly into consciousness which makes us regard contrast as a momentum of association.

Section VIII. Bain's View Criticized - Further Distinction of Perception and Idea.

Dr.Bain is one of those psychologists who regard contiguity and similarity as coördinate principles of explanation. I may say that he even goes further than this, holding, as he does, that even in contiguous association the principle of association by similarity is operative. Whether this is true or not depends largely on what we mean by similarity. In the sense in which Dr.Bain uses it, it is certainly not present in the majority of cases. He would explain such an association as that of the taste and color of an orange, when a presented taste recalls the color, by saying that the taste perception first reinstates a similar taste idea which in turn calls up its associated color idea. This, of course, may happen but it is by no means typical of an ordinary contiguous association. The middle idea is a gratuitous complication. The most obvious criticism of this theory is that closest introspection fails to discover this middle step - except in cases where it is plainly an accidental circumstance. Hence we require pretty strong a priori evidence to convince us of its existence. Such evidence is also wanting.

Then again, there seems to be a confusion in Bain's mind between the external thing and its mental representative. The former seems, possibly from its nature, incapacita-

ted from entering into any direct alliance with mental states. This separation of the thing perceived from the various perceptions of it has brought trouble enough into metaphysical camps. There, its presence is however more or less justified. In the empirical science of psychology, it cannot intrude itself without causing confusion, at least when it is brought in consciously and overgrown with metaphysical dogma. The idealistic view, however, seems to disperse difficulties and suggest explanation. And why? Because some form of idealism is really ultra-empiricism and as such adapts itself more readily to a science of experience.

These remarks apply directly to the above criticism of Dr.Bain's views. I think the dualistic position of some other psychologists whom I shall consider later, also accounts for their strange view of association. Therefore, before proceeding further, and at the risk of a metaphysical digression, I wish to indicate an essential difference between perception and idea, as this will have a direct bearing on the subject here considered.

Following Dr.Fullerton's analysis, we may regard an object as having a life history and being called the same in all its various sensational aspects. In this sense the tree seen at a distance of a hundred yeards is the same as the tree seen at a different distance, although the visual aspects are quite different. There is an indefinite series

of gradations intervening between the two visual appearances, and the sensations may and often do pass insensibly into each other. Or we may take as an example a band of music approaching from a distance. We ~~may~~ say we hear the same tones, while the actual intensities of the auditory sensations of different modalites derived from the "same" object. It is needless, however, for me to go into detail on this point, as Dr.Fullerton in his "Essay on Sameness and Identity" has so fully explained and illustrated the subject. My point is that it is this life history and the felt possibility of its recurrence in a definite order, according to previously perceived sequences, which makes the main, the only real - distinction between the objective and subjective, as these terms are currently used.

Let us take a favorite example of psychologists. The taste, smell, color, etc.of an orange are separate mental things. They have frequently occurred in close succession, and are thus closely associated, or, as some would say, fused. It is this fusion which gives rise to the object quality, which frequently takes the form of a belief or assurance that the various elements can be experienced at will in a certain order, or whenever there is a certain relationship of the group of mental experiences which we call our body and any members of the group which we call sensa-

tions from the object. Thus the implicit belief that any one of the orange sensations can be experienced under the appropriate circumstances is the essential part of the object qua object. In so far as this belief is absent, so far is the mental experience lacking in object quality. In so far as I feel the impossibility of relating a certain sound with other sensational experiences previously associated with it, I think of it not as objective but as subjective and call it a hallucination. This is especially true of the visual and tactual experiences. The ghost through which we pass our arm without resistance would to most persons be said to have a purely mental existence.

It is thus our belief in the recurrence of the customary sensory accompaniments and sequences which invests the sensation with its object quality. Of course, the permanence of the sensation is one of the conditions but not the most important. Our mere belief, however, does not constitute the object. We may be in error. Our test of the object, or, as some would say, the reality of the object, is the actual recurrence of the related experiences and the testimony of other minds. A close examination of the latter test would carry us too far beyond the limits of the present discussion.

So far we can follow Stout who says that an essential element of all apprehension is the reference of thought to an object which as the thinker means or intends it is not a present modification of consciousness. The present modifica-

tion is undoubtedly subjective in a perfectly legitimate sense of the word. It is objectified, however, not by the existence of a something outside of consciousness assumed not proved, but by the belief in so far as this is verifiable or actually verified that in certain relations, certain sensations will be experienced. Whatever may exist beyond these experiences and supporting them we cannot surmise; and this entire realm may be left to those metaphysicians who take an interest in those subjects. It is also to be mentioned that the mental experiences which are referred to objects in the manner above described are generally more vivid than those not so referred, but this is not a necessary feature. Faint sensations are frequently accompanied by objective reference while vivid ideas sometimes entirely lack this quality.

As to the relations appropriate to objective apprehension, the pre-eminent is that in which one of the members of the relation is the sensory group known as the body. I see an apple and in the relation of bodily contact, i.e. of contiguity of the visual experiences, obtain sensation of hardness; in a certain relation of tactual motor and visual experiences a sensation of smell, etc. Now, it is the absence of any such change in the mental content, conditioned by change in the perceived bodily relations which is of primary importance in distinguishing the idea of mental image from the "real outside thing". We may have a certain idea, but, under normal conditions, no perceived change in the bodily

relations as such influences it at all. We may say then that a mental experience is to be called a perception in so far as it is accompanied by or suggests the feeling or belief that it is a member of a series, whose other members are related inter-se according to a fixed oft-experienced system. In this sense the statement that the sensation is the object is seen to be inaccurate and misleading, and Stout's polemic is perfectly justified. The assumption, however, that the object has a real existence independent of consciousness, is certainly unwarranted.

I have felt myself justified in going to the above length on this question, because I think that a thorough understanding of the problem shows the fallacy at the root of some recent psychologists' views of the implication of association by similarity in all forms of association. When it is seen that perception in its fundamental nature is in no wise different from other intellectual states, the necessity of interpolating an ideal link between the perception and recall is no longer justifiable. The foregoing discussion will also be referred to when I come to treat of the genesis of perception.

Section VIII. Ziehen's View of Similarity Associations.

The explanation of the law of Similarity given above seems so plain and obvious that it is hard to understand how psychologists like Höffding and Ziehen ~~should~~

should be so much astray on this point. Ziehen, as it seems to me, is led into trouble by his very dubious theory that the memory cells of the cerebrum are distinct from the sensation cells. Again his explanation of elementary recognition is very unsatisfactory, and it is in treating of this subject that he is compelled to posit association by similarity as fundamental. He says in his "Introduction fo Physiological Psychology" (p.178) "The first idea which is associated with the introductory sensation is determined by its complete likeness, or more frequently its similarity to the latter." Once admitting similarity as an ultimate explanation he is loath to part with it, although, as will be shown presently he makes it a harmless little "kräftchen" indeed.

Ziehen assumes as the chief law of the association of ideas the following: "Each idea reproduces as its successor either an idea that is similar to it in content or an idea with which it has often appeared simultaneously." Association of the first kind he designates "internal", that of the second kind "external". Later he says associations by similarity are quite rare; excepting, of course, in those cases where the first idea is associated with the sensation, when the reproduction is caused by some similarity between the two. Even though this latter case may not be satisfactorily explained on the principle of contigious association, I would be more inclined to agree with Ward who maintains that the

assimilative process is not association at all, but something more fundamental.

But I am at a loss to understand exactly what Ziehen means when after lauding the principle of Association by Contiguity, he says: "On the other hand, the internal association, or the association by similarity is very superficial whenever it occurs in its pure form; it is probably confined almost exclusively to the acoustic ideas of words that sound alike. Thus, e.g. the acoustic idea of "guest" can reproduce the idea "guest"; the acoustic idea "pain", the idea "rain." Now why cannot these associations also be explained on the principles which have been above developed? It seems to me that the cases are entirely analagous. Ziehen himself a little further on (pp.181-182) explains the association between "sleep" and "death" precisely as I would explain it and then says: "The principle of simultaneousness (which I have called "contiguity") is quite sufficient to explain the association between two such ideas as "sleep" and "death". Expressed in more general terms, the association of those complex ideas which have one or more component ideas in common is effected according to the law of synchronism. These complex ideas are obviously internally related or similar to each other, and yet as we now see, their association is accomplished according to the law of simultaneousness and not according to the law of similarity. The foregoing statements now enable us to fully understand our previous assertion that the

association of ideas by resemblance is extremely rare. The resemblance of ideas depends chiefly upon common components, and complex ideas that have common component ideas, reproduce each other mutually by an association of contiguity." How well this description agrees with that given above by me; but when Ziehen says that the resemblance of ideas depends chiefly upon common elements, he fails to state upon what else it depends. Now it is this something else which it would be of the greatest importance for us to comprehend, i.e. if association by similarity is to stand as an ultimate ground of association at all. Ziehen, however, does not mention what the something else is; but we may presume it is to be found in the verbal associations of rain and rain, which we are told are examples of association by similarity in its pure form. After the closest inspection, however, I can detect nothing but partial identity to occasion the similarity between these two verbal ideas, viz., that of the acoustic idea ain which is common to both, or of the visual ideas a-i-n. The association seems entirely analagous to that between "sleep" and "death" which our author explains so well on the principle of contiguity. Ziehen is here undoubtedly guilty of a glaring inconsistency. And I am not sure but what a confusion of the subject-object distinction may also influence him unconsciously.

Section IX. Wundt's View.

In his "Human & Animal Psychology" (Rev.edition) Wundt explains the working of association in the main very satisfactorily. I shall have occasion later to give an account of his views on the associative element of assimilation. He takes up the consideration of assimilation, however, before investigating the so-called laws of association of ideas, and in doing so, it seems to me, falls into an error analagous to that of Ziehen's. He says: (p.) "Now it does not seem possible that an impression should directly call up the memory of another if this differs from it more or less. I can surely only arouse a memory image like itself. There may, of course, follow upon the excitation of these like elements, the reproduction of others which are unlike provided that these have been connected with the like in previous ideas. In other words a similarity association always points to the union of a likeness association with a contiguity association." Wundt makes a distinction here between similarity and likeness. He seems to mean by the latter, identity, although from his previous discussion he can hardly mean this in a strict sense. Later he says (p.) "Since no two ideas are absolutely like, it might be objected that our likeness association is itself nothing better than a similarity association. But as a matter of fact, we are not concerned here with associations between complete ideas, but with connections between constituents of ideas. Ab-

solute likeness between two ideas is impossible for the very reason that every likeness association gets at once attached to it a number of contiguity associations, the final result being either a similarity or contiguity association, according as one or the other elementary process predominates."

In the above question, Wundt qualifies the word "like" by the adverb "absolutely", saying that no two ideas are absolutely like. The objection which he mentions is a good one, but his answer is not entirely satisfactory. He says we are not concerned with ideas but with the constituents of ideas. These we may infer then are "absolutely" like. But they are not identical or they could not be associated. A man cannot be his own brother. Moreover, the use of the pronoun 'they' is seen to be unwarranted. Wundt cannot mean that they are identical. They differ at least temporally. But accepting this view, the same criticism is justified which was made above concerning Bain's view, viz., that there is no introspective evidence for this ideational explication of the impression and no good reason why we should admit it as a hypothesis.

"An idea" says Wundt (p.) "can only call up an earlier idea if it has some elements in common with that, and since the reproduced idea contains unlike as well as like constituents, the likeness connection implies the formation of a contiguity association. Likeness of the elements is directly effective." Wundt recognizes that similarity is partial

identity, or at least, the possession of common elements, but he fails to make good use of this fact. If we account for similarity by the possession of common characters and describe these common characters as separate mental entities merely like, it seems to me we are as in bad a plight as before. These like elements are in need of a similar explanation and so on ad infinitum. We must stop at a real identity somewhere, if our explanation is to be at all satisfactory, and we might as well posit it at the beginning ~~as well~~ as at any other part of the process, especially as this seems to be the most rational way and the freest of assumption and unproved hypotheses. I shall return to this question in the consideration of repetition as a momentum of association in section (Sec XI a)

Practically the same remarks are made later about successive associations as those concerning simultaneous associations. "The first thing always is" says Wundt, (p.) "that certain elements of our ideas call up like elements of other ideas. To these attach others which at some time or another were connected with them." With the latter statement I am in substantial agreement. It is in the first sentence that the gratuitous assumption is made.

Section X. Höffding's Treatment of Association.

We may now pass to a consideration of Höffding's account of the subject as developed by him in his "Outlines

or Psychology." He divides association into (1) association of ideas by similarity, (2) association of ideas by the relation between the whole and the parts, (3) association of ideas by external connection (contiguity). He considers (2) a transition form in which the two principal "laws" (1) and (3) meet. As to (1), he starts, as we might have expected, with assimilation and elementary recognition. He says (p.) "The first relation to be mentioned under this head is that of sameness (psychological identity) or similarity or congruity. This is the relation which comes into effect in sensuous perception, when the sensation arouses an (implicate) idea, and fuses with it. Here lies the starting point of all the influence which a sensation can exercise in consciousness. For whatever states and further effects it may be able to call up afterwards, the first condition is that there shall be an instinctive recognition, in other words that the sensation shall have a point of attachment in consciousness. This point then forms the starting point of further operation."

When the cause of sensuous perception is thus taken to be an association of similarity, we can possibly understand how the same principle would be called on to do explanatory service for all so-called similarity associations. As with Bain, so with Höffding, the sensation seems incapacitated from affecting the stream of consciousness by itself, it stands in

need of a substitute. And so our author passes to the next simplest association of similarity which he says consists in recognition leading to the idea of an earlier experience of the same kind. The apple on the table reminds him of the fateful apple on the tree of knowledge; the portrait of a person suggests the person himself, etc. Then these examples lead naturally to more remote relations of similarity, to analogies, parallels, metaphors, allegories.

As a general criticism of this treatment of similarity it may be urged that its method is directly opposed to modern scientific procedure. It starts from the most hypothetical cases, assumes an improbable explanation of these, and then proceeds to apply the same principles to other cases where introspection is available and should be employed. It is as if a physicist were to frame his explanation on phenomena like fluorescence, basing his theories respecting heat, light, etc. on hypotheses which might account for these ill understood phenomena.

In the consideration of (2) i.e. association by the relation between the whole and the parts (for which he gives the formula A, $+[a_2+b+c]$, the capital letters standing for sensation, the small letters for ideas), Hoffding says (p.) "The transition between association by similarity and association by contiguity is made through those cases where an idea which has been called up by another idea or sensation by way of similarity brings with it a group of further ideas with

which it is conjoined." In this class he includes the relations of qualities and actions with things and persons, cause and effect, ideas of end and means, etc. Now as a convenient descriptive category this is not bad, but as a law of association it is obviously unjustifiable. We find the a_2 of the formula again intruding itself and bringing with it the troublesome complications.

Under (3) the association by contiguity (formula a b) H[illegible]ading remarks (p.) "Sensations which always appear together give rise to conjoined ideas," and he gives examples of the usual type, but makes no mention in this particular place of the a, or a_2 i.e. the immediately associated similar or recognition idea, although later he posits this as implied necessarily in all associations, even those of pure contiguity. The first and third of these "laws", he says, have chiefly attracted attention. He remarks rather contemptuously that efforts have been made to reduce both these to a single law, generally the law of contiguity, mentioning in this connection the attempts of Hobbes and James Mill. "Association by similarity thus becomes", he says (p.) "a special case of association by external connection, accounted for by the fact that similar and allied experiences, from the nature of the circumstances, frequently occur simultaneously or in immediate succession." H[illegible]ading here probably has in mind James Mill's view, which James characterizes as one of the

curiosities of literature. It is as follows: "I believe it will be found that we are accustomed to see like things together. When we see a tree we generally see more trees than one; a sheep, more sheep than one; a man, more men than one. From this observation, I think, we may refer resemblance to the law of frequency (i.e. contiguity) of which it seems to form only a particular case." Hőffding justly criticizes this obviously artificial notion, urging that it is often the relation of similarity which causes us to bring together objects remote in time and space. This is undoubtedly true, but in demolishing this straw-man, it must not be supposed that Hőffding had shown the impossibility of accounting for association by similarity by means of contiguity association. It will be seen that the process as I have above described it (Section VI), is not in the least affected by this criticism.

Continuing, Hőffding says: "So far from association by similarity being resolvable into association by contiguity, every association by contiguity, on the contrary, presupposes an association by similarity or at least an immediate recognition." (This last disjunctive phrase would seem to indicate that Hőffding had not the utmost confidence in the view that this was really an association by similarity. I shall refer to this point again later in treating of the psychology of recognition.) "In order that A may excite

the idea B, C, D with which it usually arises simultaneously in consciousness, it must first so to speak establish its identity. Thus A must give rise to a and only then will it bring with it b, c, and d. The relation of similarity is thus the innermost germ of all association of ideas; the external connection can take effect only on presupposition of the internal." In all this Höffding is undoubtedly very consistent. If an idea can be called up only by an idea which is like it or like one previously conjoined with it, the same condition must be recognized in association by contiguity. The fallacy lies in the original assumption.

Höffding, himself, however, after inveighing against those who try to reduce all associations to one form, endeavors to accomplish the same end. He considers that there is a psychological point of view, from which the two laws may be brought under one and the same fundamental law. All ideas are embraced by the same consciousness and the manner in which they act upon one another is determined by the form and direction taken by the synthetic activity of consciousness at the given moment. The association between the parts and the whole would thus become the fundamental law of association which he proposes to call the "Law of Totality" Its formula is $a_1+(a_2+b+c)$ And from this it may be shown association by similarity and association by contiguity are extreme cases. "This when b and c decrease in strength and distinctness until lost in indefiniteness, we are left with the

formula of association by similarity (a, a) as the extreme case. Again .....the more the idea of the common elements (a, and a_2) preponderates, the stronger will the differences seem between the other elements. The totality is thus divided, as it were, into two parts (a_2 and b+c) and an association is effected with the former only. But when, on the other hand a_2 is recognized and merged with even greater rapidity and inattention we arrive at the formula of association by contiguity (a+b) ..... The law of totality is thus properly the law of association." There is much truth, but more logic than psychology in the above account. It contains the enumeration fallacy above referred to, and besides, the analysis is not carried far enough. The ideas, which Höffding symbolizes, seem to stand for simple entities, and the nature of similarity is left by him in a very crude state. When it is said that two ideas are similar this would seem to be for him a sufficient explanation of why they reinstate each other. The trouble with the attempted simplification of the "law of totality" is that a_2 is really a continued in a different setting. It is the nature of this setting or cluster which leads us to describe it as contiguous or similar. Again, the unanalyzed condition of the concept of similarity in Höffding's discussion seems to lead to a confusion. He speaks in the part quoted above of the com-

mon elements a, and a_2; and by a, a_2 he does not mean the identical constituent of the similar ideas, but these ideas themselves; for earlier in the discussion, describing an association symbolized in the formula $a_1+(a_2+b+c)$ he says: "When the sight of the fire (A) arouses the idea of a smithy, the connecting link is the smithy fire (a_2) but the image of the other objects in the smithy (b+c) emerge with it." So that when he speaks of the common elements a, a it is not quite clear whether he means the ideas themselves or their identical constituents. The use of the word "common" would seem to make the latter interpretation the more plausible , but there is nothing else in the entire discussion to indicate that this is the meaning; moreover, a_1 and a_2 are certainly used in apposition with "common elements" in the above quotation. The confusion arises naturally from his treatment of the entire question.

Höffding maintains in regard to the association of contrast, that the cases which come under this head may find a natural explanation through the influence of feeling, it being characteristic of the life of feeling to move in opposites and from first to last determined by the great contrast between pleasure and pain."After great tension in one direction there commonly succeeds a relaxation if not a tendency to turn the interest in the contrary direction." (P.) This account would lead us to expect a fairly high degree of feeling in

contrast associations. But this feeling seems to be no regular or universal accompaniment of such associations, and the presence of a middle term - the extreme case - appears to explain the facts much more simply and naturally.

I shall return to Höffding's arguments as to the relations of association and thought after having considered the momenta of association, as this consideration will be necessary to complete our view of the association process.

Section XI. Momenta of Association.

It will be remembered that in discussing the succession of ideas in consciousness, it was said that certain elements "stick" and become the centre of the next idea. If we represent the element a with its ideational cluster b, c, d, etc. -the whole forming a complex idea, the question now to be answered is, which of these contiguous elements will "stick", attain the central salience or dominate the next idea. The answer to this question is inevitably rather complicated. We may, however, simplify the problem somewhat by considering several of the influences which tend to favor a revival separately as though they existed independently of each other, which as a matter of fact is seldom or never the case. The momenta which I shall thus consider are repetition or frequency, recency, vividness or intensity, congruity or compatibility with momentary mental state and congruity with permanent or general character of the individual, or briefly,

congruity with self. I shall examine in this place the three first mentioned momenta, reserving the consideration of the last two for the succeeding section.

a. Repetition. Among these momenta, the first in importance is the principle of repetition. The more frequently two experiences have co-existed the more the one is apt to reinstate the other or give rise to a psychosis which consists of itself and the others, i.e. when it itself persists in consciousness. A very plausible psychological explanation of how this takes place has been suggested, viz., assuming that every psychosis affects some brain-cell or group of cells, it has been said that when two of these are affected by simultaneous disturbances, a nervous excitement of some kind radiates along the fibers attached to the cells in all directions. The fiber connecting the two active cells would therefore have two such impulses traversing it, and thus would be, so to say, better tuned to the function of transmission than those along which but one such impulse was sent. Of course, the more frequently the said cells were excited, the more perfect and easy would this transmission become. It is perhaps needless to say that our present knowledge of the connection of psychic and cerebral states is practically nil; nevertheless, as an hypothesis, something of the nature of the above explanation seems quite justifiable.

The effect of frequency or repetition is to make the association more rapid. This is seen in the results of practice. The rapidity may become so great that the process is introspectively unanalyzable as an associative process at all. Thus, in reading a book, the transition from the sight of a printed word to its meaning is generally imperceptible. Anyone who has learned any manual art or game has had ample opportunity to note this effect of practice.

It may be asked, however, in what sense can we say that an experience is repeated? Are any two experiences of an individual exactly alike? Most certainly not, or, at least, if they were, we should not know it as there would be no marks by which they could be distinguished. They would be to all intents and purposes one experience. This point was alluded to above (Section VI) where it was said that the ideational portion which "sticks" is not similar to any other; it is the same identical portion. It may be well for me, however, to go into the matter a little more fully, as a misuse of the words "same", "like", and "identical" has been the cause of almost as much confusion in psychology as Dr.Fullerton has shown it to have been in philosophy. Similarity is partial identity, not partial similarity or partial likeness, but partial identity. Now identity does not permit the existence of two. It is only in a very loose popular sense that we can speak of two things as being

identical. Identity means the absence of all distinguishing marks, whether of time, place, circumstance or what not. Therefore when we say that two ideas are partially identical we mean, of course, that they contain a common element, that this element is the same in both, that the two ideas overlap. It is not, however, necessary, that the two ideas should exist simultaneously in order that this relation may subsist between them. We need only consider the common element as persisting in the succeeding idea. Or if an interval, whether for a minute or a year, has elapsed, we mean by saying that an experience is repeated, e.g. that we see the same house, that a considerable part of the two mental states is identical. We call it the same because we know that its differences from the previous experience are merely spatial and temporal. A portion of psychical life has intervened and we are aware of this. These remarks may seem rather epistemological, but it is this kind of epistemology which would be of great service in clearing up many psychological problems.

b. Recency. Another quite important momentum of association is recency. Those things which have recently been experienced together tend to cohere. As time passes associative bonds tend to fade or become finally obliterated.

the psychological explanation given in the preceding paragraph is applicable to this case also. Nerve tissue in time regains a condition of equilibrium and the molecules are more apt to be thrown into activity in a certain way, shortly after such a disturbance than when such a time has elapsed as may permit them again to return to their original state. If we have just heard a cartridge explode, the sight of a cartridge will probably call to mind the explosion. The presentationally conditioned recall of a recent experience is apt to make a deep impression. The appearing of a person about whom we have just been speaking or thinking, or the sight of a word which we have lately been discussing or considering occasions a rather peculiar mental state. The phenomenon is rather striking and is it seems to be responsible for the rather inelegant adage: "Speak of the devil and you'll see his horns." It is the rapid vivid revival in these cases which may even occasion a shock of surprise, and sometimes take the form of a belief that the recent idea and the repeated experience are related as cause and effect.

c. Intensity of Vividness. By this I mean, of course, the intensity or vividness of the original experiences. If an event has made, as we say, a deep impression, its chances of recall are much increased. I remember very well my primary school techer carrying me back into the class room from which I had attempted to escape on my first day's incarcera-

tion. Rarely do I see a little child starting school life timorously but what I think of my own experience. The causes of the vividness of a mental state may be either external, internal, or both. This is merely a convenient division and the classes are not exclusive. If the vividness of a sensation is due largely to objective intensity, as e.g. a clap of thunder, the cause would seem to be external. If, on the other hand, its intensity were due largely to our mental content at the time, viz.,direction of interest, attention or emotional mood, we would say there was an internal cause for its vividness. Again, both these conditions may and often do conspire.

Section XI. Momenta of Association. (continued) The momenta which I have considered in the previous section all agree in one respect. They relate to the conditions which were present in the formation or strengthening of the association. The momenta now to be considered, however, relate to those factors which operate at the time of recall. They may also be effective as causal determinants of the formative momenta but I am not concerned with them now from that point of view.

Among the most important momenta determining the succession of ideas, I will place the compatibility or congruity of the idea with the momentary mental state of the individual. This mental state may be conditioned (1) by the environment or it may represent (2) a momentary interest

or an intellectual character, or it may consist of (3) an emotional mood. As an example of the first class of cases, I may instance the differences in the trains of thought called up by the perception of a knife in a dissecting room and the perception of a similar object in a candy store. As illustrations of (2) we have the succession of ideas in what are frequently termed trains of thought, in the attempt to solve a theoretical or practical problem, or recall a forgotten fact. I shall justify the inclusion of these processes as moments of association below in my criticism of seemingly opposed views, especially those of Stout and Wundt. As concerns (3) it is a matter of frequent observation that objects and ideas call up far different thoughts when one is in a state of despondency than when one is in a hopeful, buoyant or hilarious mood.

In all these cases, however, previous experiences of conjoined events or of their mental constituents are always presupposed. Whether a flower calls up the idea of a funeral wreath or of a dancing partner's bouquet, the previous experience of the flower together with the wreath or bouquet is a necessary factor. The sight of a dandelion leaf fails to recall the idea of the blossom if one has never observed them together. The material of all trains of thought is given in past experience, but the possibilities of its combinations are practically endless. Moreover, from the physi-

ic
ological point of view, we may say with James (Vol.i p. 567): "The amount of activity at any given point in the brain center is the sum of the tendencies of all other points to discharge in it." Thus if the element m is connected with the two elements a and b which are both in a state of excitation the tendency of m to be aroused will be greater than if it were connected with but one other element. E.g. the idea of school punishments would be more likely to arise if I have been thinking of schools and then think of punishments, than if I were to think of either school or punishment alone. Or it may happen that one of the ideas a represents a relatively permanent interest or bodily state and b a particular fleeting idea. To take an illustration from James (Vol.I p.564) "If I think of Paris whilst I am hungry, I shall not improbably find that its restaurants have become the pivot of my thoughts."

The difference between this momentum which I have designated congruity with momentary mental state and that of congruity with general character or permanent interests, now to be considered, is one of degree and complexity rather than of kind. These two momenta cannot really be separated except for convenience of treatment. Our temporary interests are dependent to a great extent on our whole mental life, and this in turn is influenced by our separate individual

thoughts. In calling this momentum congruity with self, I have reference, of course, only to the empirical self, the only self with which psychology can deal. I may make my meaning clearer by an illustration. The fisherman, naturalist and poet regard a trout from very different points of view, i.e. different thoughts are aroused in their minds by the sight of the fish. Similarly, the sight of a garter-snake or a mouse arouses quite disparate trains of thought in the mind of a boy and that of a girl. So also our trades, professions, disposition etc. affect our mental life profoundly. In so far as the will is looked upon as a reaction of the sum of our conscious life upon our physical or mental environment, it is seen to be included in this momentum. But, it will be urged, am I not going too far in ascribing these differences to associative processes? I shall be able to answer this objection better by a consideration of views opposed to mine, to which I proceed in the next section.

Section XII. Criticisms.

We are all very familiar now-a-days with the doctrine of apperception and the operations of the various apperception systems. Stout, in his recent work on "Analytic Psychology" has given possibly the best statement of the working

of apperception, which we have in English. In parts of his book he would seem to deny that association could be called on to account for any such succession of ideas as constitute what may be termed a train of thought. This always consists, according to him, of the serial resolution and determination of an implicitly apprehended whole. Now, I do not deny that Stout's statement of the case gives a very good description of the facts, but it is neither a complete nor fundamental explanation of the phenomena. Wundt also denies, as we should have expected, that we can posit association as the process at work in logical thought. Höffding also lifts his voice to the same purpose.

Stout seems to think that the play of association is best exemplified in what has been termed "ranging." In several portions of his work, he says that the book is intended to be, as its title indicates, merely analytic not genetic, so this may account for his neglect of the application of the associative principle to the higher mental processes. On the other hand, his continuous polemic against association seems to show that the analytic standpoint does not fully account for his treatment. The questions that should be considered are: "What gives rise to these apperceptive systems? How do they develop? What is their mode of action?" I am willing to allow that Stout's description is correct as far as it goes. What he calls apperception and schematic apprehension

very probably constitute conditions of thought trains. My point is that the succession of the several elements of the trains is conditioned by association although it may very well be that their congruity with momentary interests or aims or with the general character are of necessity implicated as momenta whose presence and activity are necessary factors in constituting a train of thought as such. Stout, himself, in several passages intimates that association is a fundamental condition of mental successions. Then again, this undetermined whole, which receives progressive determination as thought progresses is not sufficiently fundamental in character to stand as an ultimate explanation. I shall have occasion to return to this point again when I take up the consideration of the process of perception.

"Association" says Stout (Vol.II p.) "comes into play only in so far as coordinate elements tend to suggest each other because they have previously been combined in a certain order. In any given stage of a train of thought the next step is partly determined by the controlling influence of the central idea of the topic with which the whole series is concerned, and partly by the special idea which has last emerged. In so far as it is determined by the last idea which has just emerged the principle of association is operative; in so far as it is determined by the central idea of the whole topic, noetic synthesis is operative." Now, the idea must always

be determined by the last idea which has just emerged (I leave out of consideration here mental states which fall below the threshold of consciousness, as it would complicate the exposition without changing the fundamental notion) i.e. association is always operative. But what Stout calls noetic synthesis, without further explanation, may also be considered as an associative process; at any rate I think it should be considered not as a separate factor independent in the operations, but merely as a momentum of association. Of course when this momentum is absent or in abeyance, the nature of the mental activity will be different. So that, from this point of view, the following statements of Stout 's about mere association may be understood and with some modifications accepted: "It is mere association for instance (i.e. an associative process lacking the apperceptive momentum) which would lead a man in a conversation about peace and war to begin to talk about Peace the murderer." (Vol. II p.)

In another place (Vol. II p. 103) Stout says that the direction of attention is guided coincidently by the working of two sets of conditions: (1) by the relative excitability of different apperceptive groups; (2) by sense impressions

and by performed associations between prior and subsequent links in the train of ideas. "The succession of presentations in the focus of consciousness," he says, "may in certain cases seem to be almost wholly determined by the strength and intimacy of the associations which link together the sequent parts of the series inter se. But subjective selection determined by the performed organization of apperceptive systems and by the conditions which at the moment favor or retard their activity, is never wholly inoperative, and as a rule plays a conspicuous part ----- When one presentation a tends by association to revive simultaneously x, y, z, the selection of any one of them x, in preference to the others, depends, ceteris paribus, on the special significance and interest of x. Association and sensory stimulation brings into the field a limited number of rival claimants, each of which, so to speak, solicits attention. The decision between their respective claims depends on the comparative excitability of the apperceptive systems with which they are generally congruent." In these statements it seems to me that Stout admits the fundamental nature of the process of association. So also (Vol. II p. 41) he speaks

of "that aspect of association and especially of association as controlled by noetic systhesis which appears in its most developed forms in the mental transitions which constitute reasoning and constructive imagination." In this last quotation, Stout undoubtedly regards noetic systhesis - which has a rough correspondence to Wundt's apperception - as a control principle, and therefore second in importance and point of time to association.

In reverie, says Stout, our thoughts are apt to range or ramble from one topic to another, guided only by the casual connections of ideas, such processes being especially characteristic of weak minds. "Disciplined thinking, on the contrary is marked by continuity of interest. A train of ideas is not a train of thought, unless each link in it is a stage in the evolution of a dominant system, unless it presents successively the parts or aspects of some kind of whole." It is this point which Stout dwells on and repeats time and again and the results of introspective analysis undoubtedly indicate that the description is a very good one.

In the more polemical portions of his work, he seems to have in view the doctrines of the extreme association-

ists, who admit no other process as explanatory of mental phenomena. My point is that all mental interconnections are in the last analysis due to association, although various factors - among others noetic synthesis or apperception - may modify the active constitution and succession of mental states. The conception of the mind as an organized system or group of systems is in no wise antagonistic to the species of associationism which I have in view. On the contrary, it seems to me to help us to clarify our notions regarding mental process in general. We might even accept Stout's view that in the developed consciousness what must in theory be termed trains of thought are constantly going on. "The transitions due to the mere play of association are not transitions between isolated ideas, but between thought sequences." I think that Stout here overstates his case, but, nevertheless, if this were the exact truth, there would be no incompatibility between it and my general thesis. My main objection is that the use of expressions like "mere association" is apt to be misleading, tending to give one the impression that the associative process is far less important than it really is and than other passages of the Analytic Psychology would

seem to warrant.

The general distinction between thought and "ranging" seems to have been more or less clearly understood and expressed by various other psychologists. In so far as thinking is desultory, the essential characteristic of thinking is wanting. "The degree in which thinking is present is the degree in which the order of presentation of the parts is fixed and determined by the idea of the whole", and this "presupposes that at every step the relation of the sequent parts is attended to so as to evolve before consciousness in a systematic way the plan of combination characteristic of the whole." (Analytic Psychology Vol. II p.166)

Section XIII. Reviews and Criticisms (continued)

Wundt's view of the subject agrees in the main with that of Stout. The fundamental nature of the association process, however, is well expressed by him. In the "Human and Animal Psychology" (p.309) he says: "Now there can be no question that we find processes in consciousness which are inexplicable in terms of these associations between similar or frequently connected perceptions, although certainly presupposing the existence of the associa-

tion products."(The underlining is mine) According to Wundt, with concept ideas as with all conscious content which belongs to a logically coherent thought process, the significance of the individual is entirely dependent on the whole of which it forms a part. "Dissociated from this, it no longer possesses any significance of its own" except in so far as we leave the logical connection in which it belongs undetermined. Wundt holds that the difference between the two kinds of process, viz.,the merely associative and the logical or intellectual are characteristic and fundamental, "as evident to subjective perception as they are manifest in the uniformities objectively discoverable. "To employ one name for both, and so to suggest the view that the processes are of the same kind would serve not to clear, but seriously to embarrass to path of investigation."

He then proceeds to explain what are these subjective and objective distinguishing marks. He finds the most obvious subjective characteristic of the intellectual conscious process as distinguished from association in the accompanying feeling of activity, which in turn falls at once under the concept of internal voluntary action or

active apperception. This means that changes in consciousness are involved which are not explicable by reference to individual ideational connections, but only as resulting from the general tendency of all our conscious content at any given time - in the last resort, that is, from the whole of the previous development of consciousness, which may be termed the 'self'. It will be seen that this description corresponds broadly to what I have considered as a momentum of association, viz., congruity with self or general character. I do not think, however, that the feeling of activity is a necessary accompaniment of all trains of thought. It may frequently be present but it is not always so, and when it is, there is no incompatibility between it and the associative process. The effect of acquired dispositions may well be to favor certain elements of the idea trains, in fact, this is a matter of frequent observation. But this massive effect of our total mental constitution cannot bring about the succession of ideas devoid of all preformed mental connections. On the contrary, its function is to direct the flow of thought. The material, as Wundt himself admits is furnished by the products of association.

Later Wundt says: "For the action to take rank as a voluntary intellectual activity, it is only necessary that groups of ideas be implicated which do not stand in any obvious associational relation to those directly preceding them." Now it will be remembered that Wundt is in substantial agreement with Stout in holding that in all logically coherent thought processes, the significance of the individual is entirely dependent upon the whole of which it forms a part. Stout has given perhaps the clearest and most emphatic statement of this view. In chapter IV of the first book of the "Analytic Psychology" on Implicit Apprehension, he develops the notion of the apprehension of a whole without the apprehension of its parts, using as a very effective example, the way in which we apprehend the meaning of words, and later in the same chapter in the consideration of what he terms schematic apprehension or the phenomenon in which the "implicit idea or perception of a whole determines the successive emergence of its parts in consciousness, he paves the way for his explanation of thought processes and apperception. Thus, in the progress of a train of thought there is a "permanent and central topic, which receives progressive

specification as a schema to be filled in" (Vol.1 p.98). How this idea of the whole is formed, Stout - his standpoint being avowedly analytic - does not inform us. He finds it to be a constituent of consciousness and gives a very good account of it. But it will be readily seen that it this schematic or implicit apprehension is the essential part of trains of thought - and I am willing to admit that it is - mental activity is not necessarily implicated; atleast not in the sense of a constrained activity, no more than it is in the "mere" play of association.

Leaving aside for the present the consideration of the origen and formation of these "implicit apprehensions" we may ask how do these implicit ideas, these "synthetic" unities" determine the succession of ideas in a thought train. In answering this question, I will give a further justification of my positing congruity with momentary interests and general character as momenta of association. This implicit idea or synthetic unity of a consciousness content is itself a mental thing and as such has its points of origen, growth, and even decay. I think we are perfectly justified in viewing the "implicit

idea" as a fusion of psychical elements - and the same process will be seen to be operative in perception - which break up and recluster much in the same manner as I have described the process of ideation in association. These central, thought controlling ideas may be much more complex and persistent and are generally connected with conative tendencies, but the working of association in conjunction with the characteristic movements of the ideational stream afford, as it seems to me, an ample explanation of their activity in consciousness.

As to the volitional appect of the thought process, the following sentences from James (Psychology Vol. I p. 586) may supplement what I have said above. In speaking of the mode of recalling a thing forgotten, he says, that all "the added associations arise independently of the will. All that the will does is to emphasize and linger over those which seem pertinent and ignore the rest." This is a concise statement of one phase of the theory I have above developed of congruity with self, which is in my mind the essential character of will as a momentum of association. Practically the same thought is expressed by Coleridge in his Biographia Litteraria Chapter V (quoted by James ibid. p. 572) "The true practical law of association

is this: that whatever makes certain parts of a total impression more vivid or distinct than the rest will determine the mind to recall these, in preference to others equally linked together by the common condition of contemporeity or of contiguity. But the will itself by confining and intensifying the attention, may arbitrarily give vividness or distinctness to any object whatever." And again in speaking of the ffects of interested attention and volition, James remarks (p.594) "Even though there be a mental spontaneity, it can certainly not create ideas or summon them ex abrupto. Its power is limited to selecting amongst those which the associative machinery has already introduced or tends to introduce. If it can emphasize, reinforce or protract for a second either one of these, it can do all that the most eager advocate of free will need demand; for it then decides the direction of the next associations by making them hinge upon the emphasized term; and determining in this wise the course of the man's thinking, it also determines his acts." etc.

Among the objective peculiarities distinguishing the intellectual processes from association, Wundt mentions the totally different character of the temporal succession in the two cases. "In successive asspcoation" says he, "one

idea follows on the other as the various likeness and contiguity connections operative in the case determine. Each particular idea retains its independence. And since in a long associational series a new idea is regularly associated with only one of its predecessors, generally the most immediate, the series is subject to abrupt changes of the most varies character. Beginning and end in particular may be wholly unrelated, however complete the chain which connects term with following term. In contradistinction to this the intellectual processes always begin with general ideas ..... the relations existing among their constituents are regarded as conceptional determinations, into which the complex object is analyzed by the activity of thought. The basis of such a general idea, however, is always a complex idea associatively produced." I am not clear as to what Wundt means by "general ideas". If the thought is that in all intellectual process there is an idea of some kind of whole present during the process, what was said above in criticism of a similar view of Stout's would also apply here. If, on the other hand, by general ideas abstract ideas are meant, the statement is inaccurate. Intellectual processes need not and in many cases do not start with these.

The most general criticism of this view of the intell-

ectual processes is that association is looked at from entirely too narrow a point of view. When in a conversation on peace and war, Peace the murderer is thought of, the principle of association is allowed to be operative. So with Wundt the associational series is subject to abrupt changes of the most varied character. Any accident or absurdity is supposed to exemplify association. As a matter of fact, accidents are very frequently due to intrusion of a thought process or noetic synthesis. An instance occurs to me, an experience as teacher in a small suburban school. A little girl who had studied her geography lesson rather hard was to have a written recitation on this subject. In putting her name, which was Auralein Paxson, at the top of the paper, she wrote instead Auralein Pacific. Everyone can illustrate this fact from his own experience. Again, in speaking of the language of the insane, Wundt remarks: "It owes its origin to the blind chance of associational activity; and this continues to modify it in the most haphazard way." My principal objection to these and similar statements is that they do not tell the whole truth. Association in its broadest sense is nowhere shown so well as in the normal psychoses of a sane man. The ravings of a maniac of course reveal associative processes, but of an incomplete abnormal

kind. That momentum is absent which gives persistence, contiguity and internal logical develope mnt to the idea train. It is unfair and misleading to take such cases as typical of association. For the rest I agree in the main with Wundt in the following statements: "..... it is in this very motility of association that the germ of decay is to be looked for. It is the unfailing symptom of the weakening of voluntary control over all those connections of the ideational elements which the manifold ramifications of the associational network render possible in consciousness. We may safely say that no intellectual function is possible until these relations and connections have been collected from previous impressions. But nevertheless mental activity only becomes intellectual when the total force resulting from the whole sum of these previous experiences, the will, controls and gives definite shape to the associative material lying to its hand . In relations to these associations the will is both an active and inhibitory force - it furthers the connections concerned in the predominant interest of the moment, while it inhibits all that might draw the attention some other way." The power here ascribed to the will is what we should be led to expect from Wundt's general treat-

ment of mental activity. But here also he indicates the fundamental nature of the association products and the will is brought in merely to direct and control the flow of ideas. In so far as this volitional control exists it seems to me to be almost entirely inhibitory. In speaking of volition, Wundt maintains that the determining ground of action is not any single impression, nor any particular motive whether called up by association or arising of itself, but the entire trend or tendency of the mind which has its roots in the original nature of consciousness and the accumulated experience of the mental life. In so far then as the will controls associational revivals, it will be seen that there is no essential difference between this view and that of the congruity with self momentum of association as I have described it. But even though volition were always implicated in a train of thought, this would not mean that we were necessarily conscious of the self as willing or acting. For the practiced thinker, the activity of the flow of ideas in a train of thought is as easy as reverie for the untrained mind. It is only when some obstacle arises that he becomes conscious of a mental energy or restrained activity. With the experienced thinker there is present the consciousness of an expenditure of such mental energy.

Before bringing this section to a close, I will quote a short passage from Höffding's Psychology which will serve to supplement or at least emphasize what has been said above: "Thought proper has at its command no means and no forms which have not been already employed in the involuntary flow of ideas..... The circumstance that the association of ideas becomes the object of express interest and conscious choice cannot alter the laws of association. Thought proper can no more be emancipated from these laws than any artificial machine can arrest the laws of external nature. But we can employ psychological laws in the service of our aims just as the psychical laws."

I may now briefly summarize the rather long discussion of the last four sections. I have attempted to answer the question: "What determines the sequence of ideas in consciousness? What influences or momenta determine that b rather than c shall follow a with which both b and c are connected? I have enumerated several of these influences considering them separately, although this separation was made for convenience of treatment and was not intended as an illustration of their mode of operation. These momenta I found could be conveniently classified under five heads,

viz.,repetition, recency, intensity,congruity with momentary mental state and congruity with general character or self. An obvious division of these momenta would be to class the first three, repetition, recency and intensity as external and the others as internal. Such a classification would, however, be mainly descriptive and not strictly accurate. Repetition, recency and intensity may apply as well to purely ideational states as to perceptions. The two last mentioned momenta, congruity with momentary interests and congruity with self might be termed general in contradistinction to the others as special momenta. It is with these general momenta that I have been principally concerned in the last sections, and I have attempted to show how they render the associative principle capable of explaining the higher intellectual states, especially trains of thought which many regard as typically non-associative processes.

Section XIV. Psychological Hypotheses.

Before proceeding to the simpler more elemental mental processes, I shall attempt to justify the point of view exemplified in my treatment of them. It seems natural to the

human mind to strive after coherent, connected and completed accounts of all observable phenomena. This desire or instinct to connect and relate our various experiences has been one of the most important factors in the development of science and of all human knowledge. True it has frequently led to the assumption of false theories and even a biassed interpretation of facts, but in spite of this, the evil thus arising has been more than counterbalanced by the great gains due to having a point of view, a system and a means of relating an otherwise disjointed group of phenomena inter se. In Chemistry the atomic theory, in Astronomy the law of gravity, afford excellent illustrations of the sort of hypotheses - representative fictions - Bain calls them - which render material indispensable aid to their respective sciences. The conpuscular theory of light which Newton advanced, made possible many brilliant discoveries and explanations which we, who have long since outgrown the theory, have fortunately inherited and which have rendered possible many important inventions and paved the way for the far more satisfactory, fruitful undulatory theory of our own day. Plato's psychological doctrines though ~~though~~ undoubtedly very crude, en-

abled him to develop and systematize the observations and reflections of a long experience. So with Descartes' theory of the course of the animal spirits and of the automatism of the lower animals.

Every theory is to be tested by the way it accounts for all the observed facts; in so far as it accounts for these it is good. By synthetizing a complex group of phenomena, we are able to view them as part of a connected whole and thus to enlarge our knowledge by deductions from our hypotheses. Every science which has outgrown its childhood, and possibly also in its childhood, is in need of hypotheses, although we should not cling to a theory which new facts show to be inadequate or incorrect. From this view, the attempt to construct a purely analytic psychology is bound to be barren if carried out consistently. As Stout says (Vol.1 p.16) "Just as in ~~psych~~phys ical science we account for observed facts by assuming unobserved conditions, so in mental science, we must transcend experience in order to explain experience. Only part of the factors, which determine mental processes are definitely recognizable in consciousness. The rest even if they are not unconscious, are at least undiscriminated.

Hence all psychologists have expkicitly recognized the necessity of going beyond the data of introspection in order to frame some kind of hypotheses."

I cannot refrain from quoting in this connection the rather declamatory language of Baldwin (Mental Development pp. 37, 38) "That most vicious and Philistine attempt in some quarters to put science in the straight-jacket of barren observation, to draw the life blood of all sciences - speculative advance into the secrets of things - this ultra-positivistic cry has come here as everywhere else and put a ~~law~~ upon theory! On the contrary give us theories, theories always theories! Let every man who has a theory pronounce his theory! This is just the difference between the average mother and the good psychologist - she has no theories, he has; he has no interests, she has. She may bring up a family of a dozen and not be able to make a single trustworthy observation; he may be able from one sound of one yearling, to confirm theories of the neurologist and educator, which are momentous for the future training and welfare of the child."

Now, among the various psychological hypotheses, that of

association has seemed to be the most fruitful - although it has possibly been carried to excess by extremists. Maybe its greatest claim upon us is from the ~~psyc~~ physiological side. In fact, it seems to me to have all the qualifications which a good working hypothesis should h ave. I shall endeavor to show in the next sections to what extent assimilation, recognition and perception may be said to arise from associative connections and revivals. My previous treatment of the momenta of association indicates how these more elementary processes can be explained. In my examination of these processes I have not intentionally omitted or ignored any factors which might possibly have a direct or indirect bearing on the question.

In his work on "English Psychology" Ribot has expressed very forcibly the merits of the association hypothesis. His remarks are in places extreme, but in the main and certainly in its spirit I think the following sentences are fully justified. "Between the psychology which traces intellectual facts back to certain faculties and that which reduces them to the single law of association, there is according to our way of thinking the same difference that we find in Physics between those who attribute its phenomena to five or six

causes, and those who derive gravity, caloric, light etc. from motion.....The new theory..... shows that the different processes of intelligence are only diverse cases of a single law, that imagination, deduction, induction, perception, etc. are but so many determinate ways in which ideas may combine with each other; and that the differences of faculties are only differences of association. It explains all intellectual facts certainly not after the manner of metaphysics which demands the ultimate and absolute reason of things; but after the manner of Physics which seeks only their secondary and immediate cause."

Section XV. Perception the Result of Association.

We may begin with the consideration of the perception of an object. I have indicated above (Latter portion of Section VII) what I mean to include under the term; but it may not be amiss to repeat here the conclusions of that discussion, which is as follows: Any mental state is to be called a perception in so far as it is accompanied by or suggests the belief or feeling that it is a member of a series, whose other members are related inter se according to a fixed

oft-repeated system. When the child first sees and smells a rose there is an association formed between these two states. The next time that a rose is seen, the odor, or certain accompanying motor or affective states will tend to be revived. And likewise with the other attributes of the flower. It is obvious that the attributes or invariable attendants of the object will be most favored by frequent repetition, and that the paths of association connecting them will respond very readily. But readiness of response is also quickness of transmission and in the course of time it is to be expected that the revival will be brought about so quickly that the time necessary for conscious apprehension will not be consumed, and the separate qualities of the object will no longer stand out as temporally distinct experiences, but will probably give rise to a vague psychosis, difficult of introspective analysis. The perceived bodily relations will, as has been already indicated, form an indispensable constituent of this object-quality complex, as we may call it.

That the rapidity of the association does thus tend to a fusion of the connected elements, or of the obliteration of distinction between them is a fact familiar enough to the

most casual observation. The one illustration of the sight and meaning of words will be sufficient in this place. Of course, we may distinguish between the word and its meaning, but ordinarily, we do not with familiar words. In looking over a book, I can select words which show very clearly the different extents to which this fusion or obliteration process has been carried. Words like "treatment" "actually" "Brevity", which I just happen to see in a book before me are examples of the process where it is practically perfected. In the word "syncretism" which I have seldom read there is an appreciable lapse of time between the perception of the word and its meaning. I can remember very well when this was the case with the word "fortuitous", although now I have read the word so frequently that it is almost as well organized as any word in my vocabulary. The parallel instance of the transition of conscious to automatic action might be considered in this connection but it will be sufficient for me to merely mention it here.

Although, as a matter of fact, it will be the qualities of and the activities suggested by an object which will be so favored by repetition as to fall into the vague psychosis, constituting the object quality, other accompanying

fusion. Thus if all rose bushes one has seen have been of a very low stature, this accidental circumstance will be a regular member of the perception group. If all wet things of one's experience were soft (to take a case analgous to one of James') and all soft things wet, we could have no separate ideas of wet and soft.

The notion of the permanence of the real world is owing to the invariable connections of the sensations which form the percept masses. Wundt speaks of these mental fusions as instances of simultaneous associations and Herbart terms them complications. In the words of Wundt "One sense impression is so intimately associated with another, or at least the origin of the two is so little distinguishable in time, that the disparate constituents show themselves in consciousness only as the inter-related parts of a single idea." Stout's treatment of this problem is somewhat vacillating. He draws a distinction between ideas and impressional revivals. This is purely a matter of terminology. What he calls impressionable revivals, I have included under the term "Idea", explaining my use of this term in the beginning of my essay (Section III). In answer to the contention that both perceptual synthesis and complication were initially association of

ideas, and that they took their present form through the influence of habit; Stout objects to the word "ideas" but admits that "impressional assoc iation" is of itself enough to account for the result, and such associations are possible, he says, at least in the manner and degree required. Later in the same chapter, he says: " We have seen that complex perception does not consist in a given impression reviving a a cluster of faint images of previous impressions. None the less it does involve a mental transition, which may be properly called a suggestion or reproduction. What is primarily given is a certain impressional experience, having a specific character, and this suggests the percept of an object having a correspondingly specific character. Now this connection between the sensation experienced and the percept is not, of course, ultimately dependent on association. It follows from the very nature and genesis of the percept as a correlation of sensory data that these data should be capable of bringing it into consciousness. Nevertheless the associative principle must cooperate from the outset in the perceptual process." (Analytic Psychology Vol. II, p. 30)

I think that Stout's resolute exclusion of genetic considerations leads him to the apparent contradictions of the above and other portions of his work. In one sentence

he seems to regard association as of no importance and then a sentence or two later he insists on the indispensability of the associative process. In my opinion psychology has not yet reached the stage where it can be entirely analytic or entirely genetic. Either method, used alone, is apt to lead to inaccurate results. When Stout says that it follows from the very nature and genesis of the percept that its sensory data should be able to bring it into consciousness, I am inclined to agree with him heartily, but this nature is the outgrowth of association and this genesis is the associative process at work. "The part played by association," he says (p. 30) "becomes more prominent in proportion as the percept is more determinate and specific. This very apprehension of a thing simply as a solid body depends on a general form of noetic synthesis, probably preconditioned by inherited brain structure; but my apprehension of it as a chair or a table or an apple or an orange, depends in a much larger measure on the repetition of special experiences. Association serves to particularize general modes of noetic synthesis." But these modes of noetic sysnthesis are themselves products of association. Again, to blame the process of apprehending a thing simply as a solid body on inherited brain structure is not solving the problem but simply removing it a little

further back. Have we not abundant reason to believe that the experiences of the race and of the entire evolutional series have moulded our brains and minds to an enormous extent? The brain structure which we inherit has its causes, and for a complete exposition of our own minds, these causes must be enquired into. In the dawning intelligence of the race, there would probably be a lack of determinateness in percepts. Progress proceeds from the indefinite to the definite, and it might very well be that those associations which give rise to the perception of a solid object without further determination, would have been so favored by repetition as to have become an inherited factor by this time.

The part which I thus suppose to be played by these mental fusions or implicate associations, Stout ascribes to what he terms "noetic syntheses." "When I see a familiar thing, I feel that if I wish to examine it I shall know what to look for and how to find it. I have a prenotion or presentiment of the whole before I resolve it into its components. The complex percept is conditional by this prenotion." And later, "I know in the moment of contact that I can, if I choose, realize what the thing looks like, but I refrain from doing so. This knowledge that "I can if I choose" is noetic systhesis", etc.

We are then, I think, justified in regarding the associatively fused mental elements as the essential part of the perception in the sense in which I have above defined the word. In the case of mental blindness or mental deafness instead of assuming as Ziehen does that the sensation and its disposition occupy distinct cells of the brain, it is seen to be a much simpler and more direct explanation to consider the lesion not between the sensation and memory cells but between the sensation cells and those portions of the cerebrum which serve as the basis of the associated or fused elements which give rise to the percept quality. Of course the connection of cerebral and psychical activity is largely conjectural, and I mention the above physiological fact simply to show that my view of perception lends itself quite readily to a physiological explanation.

The above account of the perception process agrees in the main with the view of the subject developed by Höffding in his "Outlines of Psychology". The principal difference, however, and it is by no means an unimportant one, is, Höffding argues, that in order that a perception may arise ~~that~~ the sensation A ~~can~~ must recall its implicate or "gebundne" repre-

sentations ~~only~~ through the mediation of the idea a which was before associatied with b, c, d etc. I have criticized this view in treating of association by similarity so that it will not be necessary to repeat what was ssid in that connection. I shall return to the subject in the next section in treating of assimilation.

Section XVI. Recognition and Assimilation.

In all perception there is involved a form of elementary recognition. We perceive the object as a certain particular thing or a thing of a certain kind. The mental fusion which accounts for perception also accounts for this form of recognition. They are two aspects of one process. From a higher view, recognition means the knowledge that we have had an experience of the same or a similar object before. This form of recognition is generally accompanied by a definite localization in past time. In fact, this time localization is but one of the constitutents which taken together make up the recognition. I recognise a man when I remember when and in what circumstances I saw him. To recognise in this sense is to locate, and to locate is to associate with previous co-existent experiences.

The feeling of recognition may sometimes be present

without this location. In this case we must suppose that the cerebral cells underlying the associative location elements are in a state of latest excitation giving riss to a very disagreeable state of tension. We voluntarily select or emphasize certain elements which may lead to the awakening of the location elements, and we are not contented until localization ensues.

Baldwin in his "Mental Development" (p.315) viewing the case from his dynamogenic stand-point says: "Every two elements whatever connected in consciousness are so only because they have motor effects in common..... In recognition they have so much more in common that they are presented as one, and the other elements of content associated with each of them in similar ways through common motor interests cluster around the final outcome as the evident signs of the sameness of the new and the old". And later; "The sense of familiarity with an object is due to the reinstatement of the apperceptive or relational process of the earlier presentation." With this latter statement I am in entire accord, but the apperceptive or relational process of the earlier presentation is the group of associations connected with it.

It seems to me that practically the same process is at work in recognition as we found to be involved in all similarity associations. The presented object, from the identical relations of its parts with those of the previous experience groups around itself the associates of this previous experience, and this process when completed is recognition if the idea of localization is prominent in it. Of course the localization in the past may be entirely absent, and in so far as this is the case, recognition is also absent. In considering ~~recognition~~ repetition as a momentum of association (Section X) I had occasion to emphasize one view of recognition which I simply refer to in this place as it is not necessary that I should repeat it here.

Next as to assimilation in the narrower sense. I have already in my consideration of congruity with self and temporary interests as associative momenta treated in sufficient detail of the process of assimilation as implicated in apperception. We will first consider Wundt's doctrine. It will be remembered that many psychologists especially Wundt, Höffding, Ziehen and Bain are in substantial agreement as to the fundamental nature of assimilation as an ultimate determinant of association, not only of similarity but also of contiguity. We may

now consider ~~these~~ the facts again at closer range, and try to see to what extent these psychologists are justified in positing assimilation as a basal principle of explanation. Wundt (p. 287 "Human & Animal Psy.) after speaking of the associative process in, "Complication" says there is "a second class of simultaneous associations - the connections of an externally excited sense perception with its related memory images. This type of association we call assimilation and speak of the memory image as the assimilating element, the sensations following from the sense impression as the assimilated."

Again, "An impression may be apprehended in the most different ways according to the disposition in which the mind has been left by previous experiences. The result and complex idea is therefore a mixed product of the impressions given in perception and of an unknown number of memory images. But just because the idea is a single complex, there can be no question of analysis into these two constituents. Hence the reproductive elements are invariably referred to the sense perception which now contains constituents not to be found in the impression which aroused it." "Now to the extent to which an impression recalls the associated elements of a

previous "similar" impression and fuses with these, I would say that the process of association was operative and in so far as all assimilation includes such recall and fusion it may be said to be a process of association. In so far, however, as these associated elements are excluded from the notion of assimilation I would agree entirely with Dr. Ward and say that assimilation is not association at all but something more fundamental. If a tree is seen for the first time, it leaves, we may say, a mental disposition. Another tree is seen. The two experiences are similar in so far as both are trees. There are many points of disagreement but some of agreement or identity. We have actually ~~won~~ one experience in two different settings. Those points of the presentations which go to make up "treeness" are strengthened by the second experience, still more by the third, and so on. We may say, if we please, that the like or similar experiences are assimilated or simultaneously associated, but the identical portion which makes them similar cannot enter into an association, for it is but <u>one</u>. It is the common element of the two experiences.

This may seem like hair splitting but it is, to my

mind a most important consideration. Its neglect has led to numerous errors. All that I have done has been to carry the analysis of similarity to its logical end and apply the result to these psychological topics. The phenomena of coalescence, attentional preparation, illusions, etc. are obviously as explainable from this view of association and assimilation as from the relatively unanalyzed principles of Wundt and Höffding.

THE END.

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